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|------------------------------|-------------|----------------------|---------------------|------------------|
| APPLICATION NO.              | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/566,719                   | 02/01/2006  | Akira Ohbayashi      | 060109              | 7473             |
| 23850                        | 7590        | 06/18/2008           |                     |                  |
| KRATZ, QUINTOS & HANSON, LLP |             |                      | EXAMINER            |                  |
| 1420 K Street, N.W.          |             |                      | ARNBERG, MEGAN C    |                  |
| Suite 400                    |             |                      |                     |                  |
| WASHINGTON, DC 20005         |             |                      | ART UNIT            | PAPER NUMBER     |
|                              |             |                      | 1796                |                  |
|                              |             | MAIL DATE            | DELIVERY MODE       |                  |
|                              |             | 06/18/2008           | PAPER               |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                                      |   |
|------------------------------|--------------------------------------|---|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/566,719 | <b>Applicant(s)</b><br>OHBAYASHI ET AL. |
|                              | <b>Examiner</b><br>MEGAN ARNBERG     | <b>Art Unit</b><br>1796                 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 11 March 2008.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-17 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 01 February 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-146/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

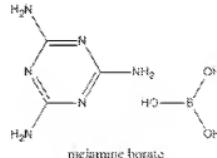
***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haraguchi et al. (WO 03/037985) in view of Hanson et al. (US 2002/0168527). Citations made to the WIPO document refer to the English language equivalent (US 2004/0254328).

Regarding claim 1: Haraguchi et al. teaches an epoxy resin composition (para. 2) comprising: an epoxy resin having two or more epoxy groups in the molecule (para. 24) as well as an amine (para. 18) and a borate compound of the formula  $\text{B}(\text{OR})_n(\text{OH})_{3-n}$  (General Formula (1)) where n is 1-3 and R is a  $\text{C}_m\text{H}_{2m+1}$  alkyl group where m is 1-10.

Not disclosed is the polyamine borate obtained from the reaction of a polyamine compound having at least one of amino group and imino group in the molecule and the borate compound. However, Hanson et al. discloses an epoxy resin composition (para.



2) with melamine borate (para. 71) which has the structure of

This compound is a polyamine since there are 3 amino groups and also has 3 imino

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groups and forms a complex with boric acid. Haraguchi et al. and Hanson et al. are combinable because they are both concerned with the same field of endeavor, namely epoxy resins for copper clad laminates. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the reaction product of Hanson et al. with the composition of Haraguchi et al. and would have been motivated to do so for such desirable properties as flame retardancy in addition to curing.

Regarding claim 2: Haraguchi et al. teaches the epoxy equivalent can be from 130-1000 (para. 35).

Regarding claim 3: Haraguchi et al. teaches the polyamine compound is an aliphatic polyamine, an aromatic polyamine and an alicyclic polyamine (para. 37).

Regarding claim 4: While the ratio of the content of the nitrogen-containing group of the polyamine compound to the content of boron of the boric acid compound is not taught, the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. See *In re Aller*, 105 USPQ 233 and MPEP 2144.05. At the time of the invention a person having ordinary skill in the art would have found it obvious to optimize the ratio of nitrogen to boron and would have been motivated to do so for such desirable properties as effective flame retardancy and reactivity with epoxy groups. A *prima facie* case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. See *In re Boesch and Slaney*, 205 USPQ 215.

Regarding claims 5 and 6: While the amount of polyamine borate is not taught, this is a result-effective variable which can be optimized. At the time of the invention a person having ordinary skill in the art would have found it obvious to optimize the amount of polyamine borate in the composition and would have been motivated to do so for such desirable properties as fast curing without effecting the properties of the resin as well as increased flame retardancy.

Regarding claim 7: The components of the composition are dissolved in a solvent including lower alcohols (para. 50).

Regarding claims 8 and 9: Haraguchi et al. does not teach additional curing agents. However, Hanson et al. teaches additional curing agents such as dicyandiamide, phenol novolak resins and imidazoles (para. 69). At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the curing agents of Hanson et al. with the composition of Haraguchi et al. and would have been motivated to do so for such desirable properties as complete curing and economically viable compositions.

Regarding claim 10: Haraguchi et al. teaches a method comprising heating while avoiding gel formation (para. 58).

Regarding claim 11: Haraguchi et al. teaches stirring until the components are dissolved to a micron size is taught (para. 59) in an epoxy diluted with solvent (para. 50).

Regarding claim 12: Haraguchi et al. teaches the solvent is removed by drying at a temperature of 40-120°C, which overlaps the claimed range (para. 65).

Regarding claim 13: Grinding/crushing the solid resin is disclosed (para. 65) by Haraguchi et al.

Regarding claim 14: A cured product/article is taught by Haraguchi et al. of the composition cured with compression molding under heat (para. 66).

Regarding claim 15: Haraguchi et al. teaches a method for producing a heat-resistant laminate sheet, which comprises: providing an uncured coating film layer of the epoxy resin composition on the surface of a heat-resistant substrate sheet; laying/layering another heat-resistant substrate sheet on the uncured coating film layer; and curing the uncured coating film layer with thermocompression bonding/thermal contact bonding (para. 17)

Regarding claim 16: The heat-resistant laminate sheet can be copper (para. 62).

Regarding claim 17: It appears that the melamine borate of Hanson et al. is the same as the claimed polyamine borate. The process steps in claim 17 for making the polyamine borate do not limit the composition unless it will clearly define the polyamine borate over that of the prior art.

#### ***Response to Arguments***

Applicant's arguments filed March 11, 2008 have been fully considered but they are not persuasive, because:

A) In response to applicant's arguments against the references Haraguchi et al. and Hanson et al. individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Specifically, the combination of both references is used for the above rejection, so arguments toward the effects of the composition of Haraguchi et al. are not germane.

B) Applicant's argument that the polyamine borate of Hanson et al. does not meet the claim limitations is not persuasive. As set forth above, the melamine borate taught by Hanson et al. is a polyamine with at least one amino group and at least one imino group with a boric acid-based compound.

C) In regard to applicant's argument to unexpected results, no evidence, such as a comparative example, is found in the originally filed specification using the closest prior art: the composition of the combination of Haraguchi et al. and Hanson et al., which is an epoxy resin having two or more epoxy groups and a melamine borate.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEGAN ARNBERG whose telephone number is (571)270-3292. The examiner can normally be reached on Monday - Friday 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. A./  
Examiner, Art Unit 1796

/James J. Seidleck/  
Supervisory Patent Examiner, Art Unit 1796